87) had nonspecific illnesses of fever, sore throat or gastrointestinal discomfort and only 8% (7/87) had hand, foot and mouth disease.
According to our previous clinical studies, symptomatic enterovirus 71 (EV71) infection can progress through four stages: HFMD/herpangina (Stage 1), CNS involvement (Stage 2), cardiopulmonary failure (Stage 3), and convalescence (Stage 4). Most EV71 cases in those studies stayed at stage 1, some progressed to Stage 2 and a few would advance to the most severe condition, Stage 3. We did autopsy for an EV71 fatal case. The brainstem pathology showed neuronophagia and immune-histochemical stain showed EV71 infected neurons, neuron loss. The most significantly risk factors associated with CNS involvement were fever$> = 3$ days and lethargy. Risk factors for pulmonary edema after CNS involvement are hyperglycemia, leukocytosis, and limb weakness. Hyperglycemia is the most significant prognostic factor for pulmonary edema.
In the follow-up study of severe EV71 cases, 18 (64%) of the 28 cases with cardiopulmonary failure after CNS involvement had limb weakness and atrophy, 17 (61%) required tube feeding, and 16 (57%) required ventilator support. Delayed neurodevelopment was found in only 1 (5%) case with severe EV71 CNS involvement and in 21 (75%) cases with cardiopulmonary failure ($p < 0.001$). Children with cardiopulmonary failure after CNS involvement scored lower on intelligence tests than children with CNS involvement alone ($p = 0.003$). Among patients with CNS involvement alone, children infected at ages younger than 2 had lower verbal comprehension than children infected at older ages ($p = 0.009$). EV71 CNS involvement with cardiopulmonary failure may be associated with neurological sequelae, delayed neurodevelopment and reduced cognitive functioning. Children with CNS involvement without cardiopulmonary failure did well in neurodevelopment. The rate of elevated attention-deficit/hyperactivity disorder-related symptoms among children with enterovirus 71 central nervous system infection was 20%, whereas that rate among matched control subjects was only 3%. They also had more internalizing problems. Enterovirus 71 central nervous system infection may affect long-term regulation of attention and emotion and cause hyperactivity-impulsivity in children.
In conclusion, most EV71 cases are HFMD and recovered. Some (possible 1%) progressed to Stage 2 encephalomyelitis, and 20–30% of cases with encephalomyelitis may progress to cardiopulmonary failure because of brainstem encephalitis and SIRS. Even under modern intensive care, 30% of them would die and many of the survivors would have neurological sequelae. After poliovirus was nearly eradicated by vaccination, EV71 is now considered one of the most important enteroviruses. Therefore, continuous surveillance of its occurrence, investigation of its virulence and its transmission are all warranted to improve the future control. Development of EV71 vaccine are ongoing and we hope for success in the near future.

SYMPOSIUM 11 (SP 11)

EBOLA VIRUS DISEASE

SP 11-1

WHAT WENT WRONG IN WEST AFRICA AND WHERE ARE WE HEADED

Dale Fisher. *Professor of Medicine and Head of the Infectious Diseases Division at the National University Hospital, Singapore*

The Ebola outbreak in West Africa is simply staggering in so many respects. Originating in a rural town Meliandou in Guinea it could have been like any other Ebola outbreak. A single animal to human transmission with some degree of human to human spread most notably at funerals to family members or hospitals to health care workers. Typical outbreaks last months, they are contained fairly locally and eventually controlled by a fairly standard approach rolled out by MSF. However this outbreak is different with never before seen scale in terms of case numbers and deaths. There are many reasons to explain this outcome almost all related to the setting in this part of Africa and human factors.
Movement in this area is not difficult and as people become frightened and witness death it is not surprising that people drive across the country to see family despite being sick and despite the advice. For this reason the geographic spread has been difficult to curtail, although limiting it (by and large) to the 3 most affected countries is a true success story of work done in Mali, Nigeria and other bordering countries.
Infection control, case management and social mobilization efforts have had to likewise geographically pursue the outbreak. Necessarily this has seen the evolution of novel and community based case management strategies as the community is the regular front line while waiting for treatment units to be established.
There is belief that zero cases can be reached and that Ebola virus disease will not become endemic but that is not guaranteed and ongoing efforts that continuously adapt to circumstances will need to be maintained for some time yet.

SP 11-2

EBOLA BIO-SAFETY AND LABORATORY TESTING

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Ebola outbreak in 2014-—2015, the largest in history of Ebola infection, mainly affected a few countries in West Africa. According to the World Health Organization, over 21,700 Ebola cases have been reported in nine countries and over 8,640 people have died. According to the United States Centers for Disease Control and Prevention (CDC), a few imported cases and locally acquired cases in healthcare workers were reported in the US (http://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/index.html).
CDC provided the infection prevention and control recommendations and guidance for caring hospitalized patients under investigation (PUI) for Ebola Virus Disease (EVD) in U.S. hospitals. It's important to follow standard contact and droplet precautions when caring for a PUI or patient with confirmed EVD. CDC updated personal protective equipment (PPE) portion of the guidance based on the experience of treating patients with EVD in US hospitals including Emory University Hospital. The procedures for putting on (Donning) and removing (Doffing) is posted (http://www.cdc.gov/vhf/ebola/hcp/procedures-for-ppe.html).
Procedures that could increase environmental contamination with infectious materials such as body fluid and contaminated medical supplies and equipment or create aerosols should be minimized. CDC lists key components of standard, contact, and droplet precautions recommended for healthcare personnel working in healthcare settings who have the potential for exposure to patients and/or to infectious materials. For patient care considerations, it is best to limit the use of needles and other sharps as much as possible, keep the phlebotomy, procedures, and laboratory testing to the minimum necessary for essential diagnostic evaluation and medical care.
Rapid laboratory tests for diagnosis of Ebola and/or malaria have been developed and used. In addition, rapid tests using point-of-care type analyzers for monitoring electrolytes, respiratory status, liver function, plates are available for patient management.

SP 11-3

FIGHT AGAINST EBOLA: PREPAREDNESS AND PUBLIC HEALTH RESPONSE

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On August 8, 2014, the World Health Organization announced the outbreak of Ebola virus disease (EVD) in West Africa a public health emergency of international concern under the authority of the International Health Regulations (2005) and issued recommendations for affected and non-affected countries regarding preparedness and response against Ebola. Countries without domestic Ebola transmission are requested to establish core capacities to prevent, detect, characterize and respond quickly, efficiently and in a coordinated manner to the EVD threats in order to reduce mortality and morbidity. A comprehensive risk assessment based on well-established criteria would guide countries to determine timing to active the preparedness and response plan.
This talk will address international and domestic preparedness and response against Ebola using the successful story of Nigeria during July 23 to October 20, 2014, as an example. A key element for successful EVD control was the rapid response for activating an Ebola Emergency Operations Center (EOC) by using the Incident Management System (IMS). The EOC effectively coordinated all available public health resources and applied real-time technology in contact tracing and logistics management. Difficult contact tracing was handled with the assistance of psychosocial support team and social mobilization by conducting house-to-house visiting. The alert and rumor surveillance helped discover new cases.
In response to the Ebola outbreak, the Taiwan Centers for Disease Control (TCDC) had issued travel alert and taken measures for preparedness and response since early April, 2014. On August 8, TCDC upgraded the response

level and established "Ebola Virus Disease Emergency Response Task Force" to implement the following four major measures against Ebola: (1) health education for outbound passengers; (2) quarantine for incoming passengers from affected West African countries ; (3) preparedness and drill of designated health care facilities; and (4) international collaboration. TCDC continues to monitor the trend of outbreak and timely adjust the response and control measures against Ebola.

SYMPOSIUM 12 (SP 12)

STRATEGIES FOR NEW PROBLEMS ON HEALTHCARE-ASSOCIATED INFECTIONS

SP 12-1

STRATEGIES FOR NEW PROBLEMS ON HEALTHCARE-ASSOCIATED INFECTIONS IN JAPAN

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Introduction: In Japan, the outbreak of methicillin resistant *Staphylococcus aureus* (MRSA) in hospitals in 1980's has brought clinicians the concept of infection control. Establishment of infection control team (ICT), generally comprised of medical doctors, nurses, pharmacists, and other professionals has contributed to prevention of healthcare-associated infections. All staffs working at hospital are encouraged to receive lectures including environmental hygiene and hand washing. Use of some antibiotics with broad spectrum is monitored by ICTs.
Problems: Nevertheless, patients are still suffering from severe healthcare-associated infections causing delayed recovery and poor outcome. Clinicians may not pay any attention to preservation and improvement of host defense system against pathogens. Some clinicians even do not know the significance of the procedures of washing and sterilization of medical instruments.
Strategies: Here, we would like to propose two strategies for better infection control. The first one is nutritional therapy. Repletion of nutritional status leads to reduced morbidity of infectious complications. Particularly, use of gut as nutritional delivery route strengthens host defense system and use of immuno-nutrients is known to modulate host response to various insults.
The other one is better management of central sterile services department (CSSD). Failure of CSSD function results in devastating problems in infection control. However, it is regrettable that there are only a few hospitals where medical directors devote to management of CSSD.

SP 12-2

STRATEGIES FOR NEW PROBLEMS ON HEALTHCARE-ASSOCIATED INFECTIONS IN TAIWAN

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The 2003 severe acute respiratory syndrome (SARS) outbreak marked a turning point in HCAI control in Taiwan. Since the SARS outbreak, hospital infection control and compliance with infection control guidelines have been significantly improved due to the attention of hospital leadership, contribution of infection control staff and the cooperation of clinical personnel. Nevertheless, many new problems in HCAI emerge. More aggressive and intensive treatment, more invasive procedures lead to increasing debilitating and device-dependent patients in the community and healthcare facilities. The nationwide populations susceptible to HCAI increased. Furthermore, frequent international travel and frequent hospitalization to different facilities in Taiwan facilitates the cross transmission of multi-drug resistant organisms in healthcare settings. In order to eliminate and tackle the new problems on HCAI, Taiwan CDC has formulated strategies according to the 8 core components for infection prevention and control programs proposed by WHO and conducted care bundle pilot project to reduce CLABSI in Taiwan from year 2010 to 2011. The rate of CLABSI declined 11.2% from 5.81 to 5.16 per 1,000 central line days during pilot study period. The results suggest that a coordinated, multi-institutional infection control initiative might be an effective approach to reducing CLABSI. After care bundle pilot project, national action plan to eliminate CLABSI in Taiwan has been promoted since 2013 in order to achieve our ultimate goal "zero tolerance" to HCAI.

SP 12-3

STRATEGIES FOR NEW PROBLEMS ON HEALTHCARE-ASSOCIATED INFECTIONS IN CHINA

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The new situation of infection control in China, including the increasing risk of Healthcare Associated Infection, the change of medical needs and medical system, the infection risk of health care workers, how to implement the policies and regulations of Healthcare Associated Infection, the new connotation of HAI and how to improve the capacity of prevention and control of HAI etc. The strategies for how to deal with the new situation, such as strengthening the construction of HAI management discipline and cultivation of talents, setting up HAI training base, improving the capacity of risk assessment, improving the capacity of HAI prevention and control through scientific research etc.

SP 12-4

THE ROLE OF THE PATIENT IN A MULTIDISCIPLINARY TEAM - THE PATIENT IS "IN"

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So far, most infection prevention strategies have traditionally been addressed to healthcare workers, and in particular to infection prevention doctors and nurses. Aside of guidelines targeting behavioral and cultural aspects, these included also recommendations of structural aspects of hospital building and facility management. However, the patient himself may become both, target and distributor of healthcare associated infections (HAIs), if a minimum knowledge on infection prevention is lacking. Because of the great potential, this unexploited reserve should be included into future infection prevention activities. In an initial step, the patient shall be included into measures able to contribute towards the patient's own self-protection against HAI. This, however, requires the education of the patient. The patient will always show compliance if he is included as cooperative partner for the entire treatment process, including the prevention of nosocomial infections.
Here, our first results will be presented and it will be demonstrated how the patient may be successfully be included in his self-protection against nosocomial infections. The following chief topics are the focus of the initiative:

- Poster in the foyer of the hospital which calls attention to the importance of hand hygiene with emphasis to use the automatic dispensers in the lobby and at entrance to the wards with increased risk for infection (ICU etc.)
- Delivery of patients flyer as part of patient records highlighting the importance of hand hygiene, to avoid unnecessary contact with objects and surfaces in hospital, the role of hand hygiene before and after toilet use, and on protection measures at colonization or infection with multidrug-resistant pathogens (MRSA, VRE, Gram-negative bacteria, Noro viruses)
- Message of patients of any anomalies in the course of treatment to the medical team, i.e. pain at insertion of peripheral venous catheter
- Preparing before surgery
- Wound care and changing of wound dressing
- Behavior for those having a stoma
- Checklist for the risk assessment of possible colonization by multidrug resistant microorganisms (recording sheet as questionnaire) as self-assessment
- Use of breakfast television in the clinic (patients channel) to educate the patient with the short film "How can I protect myself during my hospital stay before infection - a short film for a long life"
- Introduction of the infection prevention check-out (evaluation of hygiene by the patient with a questionnaire).

All patients showed high levels of interest, were open-minded and welcomed their involvement in the self-protection against HAI.